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EXAMINER

STIMPert, PHILIP EARL

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/582,037 | Applicant(s) HIGASHI ET AL. | |
| | Examiner Philip Stimpert | Art Unit 3746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10 and 12 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims s 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US PGPub 2002/0157717 to Hong (Hong) in view of US Patent 4,516,406 to Gentry et al. (Gentry).

3. Regarding claim 1, Hong teaches a compressor (1) comprising a compression mechanism (25) configured to compress fluid, the mechanism including a discharge port (113). Hong also teaches a reed valve (120), a valve retainer (130, 135) coupling the reed valve to the discharge port (113), and that the valve retainer is composed of a shape varying member (130, 135) that varies in shape in response to the linear position of the adjustment bolt (143) so as to change an opening/closing state of the reed valve (120). Hong does not teach that the shape varying member varies in shape in response to a voltage application. Gentry teaches a cooling system including a flapper valve (74) whose opening state may be adjusted by the linear motion of a solenoid (76, see col. 2, ln. 19-35). In other words, Gentry teaches an apparatus for producing linear motion to affect the position of a valve member. As such, one of ordinary skill in the art could have used a solenoid as taught by Gentry to provide the setpoint for the spring (145) of Hong, providing the predictable result of a reed valve having adjustable responses.

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Where a claimed improvement on a device or apparatus is no more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for improvement," the claim is unpatentable under 35 U.S.C. 103(a). *Ex Parte Smith*, 83 USPQ.2d 1509, 1518-19 (BPAI, 2007) (citing *KSR v. Teleflex*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007)). Accordingly Applicant claims a combination that only unites old elements with no change in the respective functions of those old elements, and the combination of those elements yields predictable results; absent evidence that the modifications necessary to effect the combination of elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a). *Ex Parte Smith*, 83 USPQ.2d at 1518-19 (BPAI, 2007) (citing *KSR*, 127 S.Ct. at 1740, 82 USPQ2d at 1396. Accordingly, since the applicant[s] have submitted no persuasive evidence that the combination of the above elements is uniquely challenging or difficult for one of ordinary skill in the art, the claim is unpatentable as obvious under 35 U.S.C. 103(a) because it is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another. Further, one of ordinary skill in the art would appreciate that such a substitution would eliminate the need for a user to manually adjust the adjustment bolt, allowing the compressor to respond to changing conditions during operation.

4. Regarding claim 2, Hong teaches that the valve retainer includes a valve fixing part (135) for fixing a fixed part (surrounding bolt 170) of the reed valve (120) and a curved guiding part (135) for restricting a rightmost valve part of the reed valve to a lift

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amount (as shown in Figs. 3-5), and that the guiding part (135) is the shape varying member which varies the lift amount of the valve part.

5. Regarding claim 3, Hong teaches that the shape varying member of the guiding part (135) changes in a warp amount (see Figs. 4 and 5 particularly) so as to change a curve of the shape varying member and of the reed valve (120).

6. Regarding claim 4, Hong teaches that the valve retainer includes a valve fixing part (130) for fixing a fixed part (surrounding bolt 170) of the reed valve (120) and a curved guiding part (135) for restricting a rightmost valve part of the reed valve to a lift amount (as shown in Figs. 3-5), and that the fixing part (130) is the shape varying member which varies a rigidity of the valve part (paragraph 36, load adjustment of reed valve).

7. Regarding claim 7, Hong teaches a compressor (1) comprising a compression mechanism (25) configured to compress fluid, the mechanism including a discharge port (113). Hong also teaches a reed valve (120), a valve retainer (130, 135) coupling the reed valve to the discharge port (113). According to the combination, part of the retainer (130, 135) is a shape varying member which changes in shape in response to a voltage applied to a solenoid as taught by Gentry so as to change an opening/closing state of the valve.

8. Regarding claim 8, Hong teaches that the valve retainer includes a valve fixing part (135) for fixing a fixed part (surrounding bolt 170) of the reed valve (120) and a curved guiding part (135) for restricting a rightmost valve part of the reed valve to a lift

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amount (as shown in Figs. 3-5), and that the guiding part (135) is the shape varying member which varies the lift amount of the valve part.

9. Regarding claim 9, Hong teaches that the shape varying member of the guiding part (135) changes in a warp amount (see Figs. 4 and 5 particularly) so as to change a curve of the shape varying member and of the reed valve (120).

10. Regarding claim 10, Hong teaches that the valve retainer includes a valve fixing part (130) for fixing a fixed part (surrounding bolt 170) of the reed valve (120) and a curved guiding part (135) for restricting a rightmost valve part of the reed valve to a lift amount (as shown in Figs. 3-5), and that the fixing part (130) is the shape varying member which varies a rigidity of the valve part (paragraph 36, load adjustment of reed valve).

11. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong in view of Gentry as applied to claims 1 and 7 above, and further in view of US Patent 4,432,311 to Holtzberg et al (Holtzberg).

12. Hong teaches the invention of claim 1 from which claim 6 depends, as discussed above, but does not teach that the shape varying member is formed of polymer.

Holtzberg teaches a composite, polymer valve spring retainer for use in an engine.

Holtzberg teach the use of polymers which are lighter and stronger than metals in fluid machines such as engines and compressors, providing the benefit of decreased weight and quieter performance (col. 1, ln. 46-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the shape varying

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member of Hong from polymer, as taught by Holtzberg, in order to reduce the weight of that component and thereby that of the system as a whole.

Allowable Subject Matter

13. Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: the limitation of a shape varying member changing in length is not shown in the prior art of record in combination with the remaining limitations of those claims.

Response to Arguments

15. Applicant's arguments, see page 5, filed 26 October 2009, with respect to indefiniteness have been fully considered and are persuasive. In light of the explanation presented therein, the rejection of claim 5 has been withdrawn.

16. Applicant's remaining arguments have been considered but are either moot in view of the new rejections presented in this action, or are not persuasive.

17. The arguments against Hong individually are rendered moot by the combination with Gentry, which utilizes a solenoid responsive to a voltage application to provide the shape variance.

18. With respect to the arguments against Holtzberg, the examiner disagrees as to the meaning of "polymer actuator." In particular, the language of claims 6 and 12

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merely requires "a polymer actuator." It does not require a polymer actuator that has the piezoelectric qualities alleged by the applicant. Thus, forming the shape varying members of the combination from a polymer is sufficient for them to be considered polymer actuators, since they are in a broad sense actuating the changed behavior of the reed valve (120) of Hong. Further clarification of the direct relation between the polymer, the applied voltage, and the resulting shape variance would be necessary to overcome the current interpretation.

19. As a final matter, the examiner notes that the final clause in the independent claims, "so as to change an opening/closing state of the reed valve," appears to misstate the applicant's invention. The usual reading of this limitation on its own would indicate that the retainer's change of shape is actively closing or opening the valve, or in other words, that it is providing motive force to actively control the state of the valve. The examiner believes that this is misleading. The applicant's invention seems to remain a passive check valve, but one whose characteristics (or behavior) change in response to the applied voltage. This could perhaps be better stated as "so as to change an opening/closing behavior of the reed valve," or something similar.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

/P. S./
Examiner, Art Unit 3746
28 January 2010